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BALLISTIC MISSILE DEFENSE - - THE CRUX OF THE MATTER

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SUMMARY

Today this country stands devoid of defenses against the weapon which will cause the greatest loss to life and property in the event of a general nuclear war, the intercontinental ballistic missile. The threat is present and there are many who believe that the means to combat it are also available. The purpose of this paper is to discuss and assess the issues involved in the controversy over deployment of a ballistic missile defense (BMD) for the protection of the continental United States.

The most difficult aspect of the missile threat stems from the problem of defense saturation. Inability of the Nike-Zeus system to handle large numbers of incoming objects, be they actual warheads or warheads in combination with decoys, resulted in the decision against its deployment. Design of the present Nike-X system is predicated on overcoming this problem. Nevertheless, complete protection against an all-out missile attack appears impossible.

The principal issue over BMD deployment concerns the degree of protection which can be provided relative to the high cost involved. While it can be shown that BMD, in combination with a fallout shelter program, can save tens of millions of lives, questions of deterrence, the likelihood of attack, and other uncertainties prevent the cost-effectiveness approach from providing an absolute answer on deployment.

Other arguments relate to possible international destabilization resulting from BMD deployment and to the effects of nuclear proliferation on the desirability of active defenses. While these points require examination, it appears that only the Chinese threat in the middle 1970s is a key issue--for this possibility, deployment has direct application.

This paper concludes that consideration of active antimissile defense must include the following points: means other than massive retaliation must be provided for the failure of deterrence, a balanced deterrent against all forms of attack is required, defense contributions short of complete protection are meaningful, and the possible saving of millions of US lives warrants implementation of a combined shelter-BMD program.

CHAPTER 1

INTRODUCTION

Over eight years ago, the USSR successfully tested its first intercontinental ballistic missile (ICBM), which added a new dimension to the continuing strategic confrontation between the Soviet Union and the United States. The demonstration of a Soviet thermonuclear capability some four years before, although received with grave concern in the West, had not significantly changed the basic power equation. The US nuclear delivery capability far outweighed that of the Soviets, and effective US air defenses were deployed to meet the threat posed by USSR intercontinental bombers. Massive retaliation had been a reassuring strategy due to the preponderance of the US capability in comparison with the Soviets' means.

Now, however, the inevitable marriage of Soviet nuclear warheads to ICBMs drastically disturbed the balance of power. Here was a weapon whose intercontinental delivery time was measured in minutes rather than hours, which would arrive without warning, and for which there was no defense. Thus, the US was faced with the reality that a force of several hundred Soviet ICBMs could devastate the industrial and population centers of this country in very short order--something several hundred Soviet bombers could not hope to achieve--regardless of the weight of the US retaliating blow. National survival was, and is, very much in jeopardy in the event of failure of mutual deterrence.

In view of this bleak possibility, why has a means not been devised to cope successfully with the ballistic missile threat? What of the Army Nike-X ballistic missile defense (BMD) system which is alleged to be effective against this type of threat?

BMD, in general, and the Nike-X system, in particular, are extremely controversial issues in high government positions, in scientific circles, and in the military itself. The burning question of BMD deployment for continental US protection arises annually. Each year the answer is a deferral of this crucial decision at the Secretary of Defense level, while Nike-X development effort is continued on a priority basis.[1]

The Nike antimissile development effort, originating with the Nike-Zeus program and progressing to the current Nike-X system, has been underway more than eight years and has cost over two billion dollars to date.[2] It is the only "hardware" research and development program in the Free World dealing with the interception of ICBMs, as well as lesser-range ballistic missiles, and has made great strides in recent years. Indicative is the fact that the Joint Chiefs of Staff, in 1965 for the

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[1]Jack Raymond, "War Spending in '67 Is Estimated at $10.3 Billion", New York Times, 25 Jan 1966, p.18; "Text of President's Message and an Analysis of Federal Budget of "$112.8 Billion," New York Times, 25 Jan 1966, p.22.

[2]Harold Brown, Hearings on Military Posture and H.R. 4016, pp. 1551-1552.

first time, unanimously recommended the inclusion of funds in the FY 1967 defense budget to initiate Nike-X production.[3]

It is perhaps difficult to understand, in view of the magnitude of the threat, the developmental success of the system designed to counter it, and the strong support which Nike-X receives, why the government does not authorize the production and deployment of an antimissile system for continental US protection. Obviously there are cogent reasons why this step has not been taken; what are they that possibly allow national survival to hang in the balance?

Since this subject is of vital importance today, the major issues both for and against BMD deployment need examination and understanding. The intent of this paper is to make an assessment of the "pros and cons" of the deployment of a defense for the protection of the continental United States against ballistic missiles. This assessment will be made by first outlining the fundamentals of the problem posed to the defense. Next, the general approach of the Nike-X system to the solution of this problem will be described briefly, not because of any prejudice in its behalf but since it represents the only US defensive system capable of deployment in the foreseeable future. This will be followed by an analysis of the major arguments arising from considerations of the deployment of such a system, with emphasis on

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[3]Jack Raymond, "New U.S. Delay Likely in Building Missile Defense", New York Times, 1 Dec 1965, pp. 1; 14.

strategic implication rather than on technical aspects of deployment. Conclusions will be derived from the foregoing analysis.

CHAPTER 2

THE NATURE OF THE THREAT

To appreciate the arguments relative to BMD deployment requires some understanding of the nature and magnitude of the problem which the defense must solve. What is the threat and how can it best be countered?

THE DEFENSE PROBLEM

Obviously, for any missile defense to be effective it must successfully engage attacking missiles before they can reach and destroy their intended targets. It is also quite apparent that the best time to accomplish this is before the enemy missiles have left their launch pads. This is highly impractical from the US standpoint, however, except on a second-strike basis; and by then it is too late to have averted the destruction of many US targets. The only alternative is to engage the attacking missiles at some point along their trajectories and the farther away from their targets the better.

There are three portions to an ICBM trajectory; launch, mid-course, and terminal. It would be most desirable to intercept an ICBM, once underway, during its launch or boost phase, while it is traveling relatively slow. Exotic schemes have been postulated for this type of engagement, usually involving satellites in earth orbit, equipped with infra-red seeking interceptor missiles; but this approach does not appear feasible for some time to come.

The mid-course phase consumes the great majority of an ICBM's 30-minute flight time when fired to a nominal 6,000-mile range. While this would appear to be an ideal period in which to attack an ICBM, due to the amount of time available for the engagement, it also involves still-unsolved complications. The principal difficulty is that the ICBM may be accompanied by penetration aids or decoys to confuse the defending radars or other sensors. Outside the earth's atmosphere even simple balloons of the proper shapes and sizes cannot be discriminated from actual warheads. To engage all of the possible objects in an ICBM attack at the extreme ranges involved in a mid-course engagement imposes prohibitive costs on the defense.

Turning to the terminal-intercept approach, as an attacking missile nosecone approaches its target it must re-enter the atmosphere at about 400,000 feet altitude. Interaction with the atmosphere causes it to slow down at a different rate from any accompanying decoys, unless they match it exactly in ballistic coefficient (a measure of an object's drag, area, and weight). This and other atmospheric effects help defense sensors to discriminate warheads from objects which are too light or too small to be actual threats. Even with this deceleration, however, the time from re-entry to impact amounts to less than 90 seconds. Hence the defense, particularly if decoys are involved, has very little time to react to an incoming missile attack. Difficult as the task is, the terminal-intercept approach is the only feasible

one today and is the approach on which development effort is concentrated.[1]

THE THREAT

Soviet ICBM capabilities generate the primary missile threat to the US throughout the next decade. The Chinese threat in this time frame will be rather crude and limited. Therefore, the more sophisticated Soviet model is of major interest. Every feasible capability must be accorded the USSR, while exercising judgment and restraint based on known and expected Soviet approaches to problems.

A part of any threat consideration entails an assessment of its magnitude. Reliable estimates of the size of the Soviet ICBM force are highly classified and, therefore, are not available for inclusion here. In this problem, however, precise numbers are not necessary. It has already been indicated that several hundred Soviet ICBMs could destroy virtually all of the major population and industrial complexes in this country, and even a conservative estimate must credit the USSR with at least this number of intercontinental missiles.

In considering the threat, it is sometimes overlooked that Soviet thrust capabilities provide them with the option of striking the US either from the North or via the South Pole. Whether

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[1]Charles M. Herzfeld, "Ballistic Missile Defense and National Security", Air Force Policy Letter for Commanders Supplement, No. 2, Feb 1965, pp. 9-10.

they would choose the latter route, with certain resulting technical complications, depends primarily on their assessment of the value of circumventing the northern-oriented Ballistic Missile Early Warning System (BMEWS). The significance of this Soviet option to US planners is that complete reliance cannot be placed on the 15 minutes of BMEWS-provided warning and that a deployed BMD must have 360° coverage--the submarine-launched missile threat reinforces this defense requirement.

From the defense standpoint, the most difficult aspect of the threat pertains to saturation. This can arise if the defense's target-handling capacity is exceeded through the arrival of more threatening objects than can be engaged, either simultaneously or by successive intercepts. The objects may be actual missile warheads or warheads accompanied by decoys which cannot be discriminated and which must, therefore, be treated as the "real thing". The decoy approach is the cheaper one for the offense and is certainly within Soviet technical capabilities, although the development of decoys which are effective through the re-entry process requires a major effort.[2] Options available to the defense are to improve discrimination techniques and/or to

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[2]Robert S. McNamara, Statement of Secretary of Defense before the House Armed Services Committee on the Fiscal Year 1966-70 Defense Program and 1966 Defense Budget, p. 55 (referred to hereafter as "McNamara, Statement of Secretary of Defense").

increase target-handling capability. The former is limited by the state of the art in the still-new scientific field of re-entry physics, and the latter must be economically competitive with the opposing offensive systems to be practicable.

CHAPTER 3

THE NIKE-X APPROACH

Before proceeding to a discussion of the debated aspects of BMD deployment, the Nike-X approach to the ICBM-intercept problem will be outlined briefly, since the techniques employed bear directly on the question of saturation.

THE PREDECESSOR: NIKE-ZEUS

Nike BMD development was undertaken in an era when the ICBM was characterized by many as the ultimate weapon. Interception of an ICBM warhead was considered such a Sisyphean task that Secretary of Defense Thomas S. Gates, Jr. and Dr. Herbert York, Director of Defense Research and Engineering, likened it to "hitting a bullet with a bullet."[1] Others used the "needle in the dark" analogy. Nevertheless, Nike-Zeus development was initiated in 1957 and culminated five years later at the Kwajalein Island test site with a series of successful intercepts of target nose-cones lofted across the Pacific by Atlas and Titan boosters launched from Vandenberg Air Force Base in California.[2]

While the Zeus system proved that intercept was possible and advanced the state of the antimissile art considerably, it

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[1]US Congress, Senate, Subcommittee of the Committee on Appropriations, Department of Defense Appropriations for 1961, p. 1066.

[2]"Nike-X (Zeus) Record", Armed Forces Management, Vol. 10, Apr 1964, p. 72.

fell prey to the saturation problem. It employed large, mechanically scanned radars, one for target acquisition, another for target discrimination, and one each to track the incoming target and the outgoing Zeus interceptor missile. The track radars were tied up by the engagement in progress, thus limiting the target-handling capacity of the system. Multiplication of radars was the only solution to this problem, and cost placed limitations on this approach. In addition, these same radars, with their dish-type antennas, were vulnerable to blast damage from nearby nuclear bursts.

Another problem resulted from the fact that the Zeus missile, a large, 48-foot "brute", was designed primarily for intercepts at hundreds of thousands of feet altitude. With the advent of ICBM penetration aids, however, the warhead vs. decoy decision must be made late in order to capitalize on atmospheric effects as an aid to discrimination. Despite its 20g's of acceleration, making it the "hottest" missile in the US arsenal at the time, this system could not wait this late with assurance, particularly when major system components were urgently needed for the next engagement in a high-density raid.[3]

Dr. Jack P. Ruina, then Assistant Director, Defense Research and Engineering (Air Defense), summed up the situation when he said:

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[3]For a description of the Nike-Zeus System, see "How Zeus Operates", Armed Forces Management, Vol. 9, Apr 1963, p. 50.

> . . . there is little doubt that it [Zeus] can be effective against low-rate-of-arrival single warheads. This is no mean accomplishment in itself and should not be underestimated. Ballistic weapons from stones to rifle bullets have never been successfully attacked in this way before, and it is a tribute to the technical competence of the engineers working on this program that well-informed scientists agree that the approach is feasible. When the probability is considered, however, that the enemy can, without prohibitive cost to himself, provide for nearly simultaneous arrival of multiple targets, either decoys, or perhaps even true warheads, then it is clear that in its present design the Nike-Zeus's firepower can be rather easily saturated.[4]

NIKE-X IS BORN

Faced with this truth, the Army undertook a complete redesign of the system. Designated Nike-X (and presumably still looking for a permanent name in the tradition of its predecessors, Ajax, Hercules, and Zeus), the new system incorporates a dramatic technological advancement in radar known as "phased array". This technique permits the design of radars which scan electronically rather than mechanically, obviating the need for rotating antennas. Thus, the radar installations can be largely below ground and hardened to withstand high levels of blast overpressure. More transmitted power can be applied; but most important, by means of electronic switching the shape and direction

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[4]US Congress, House, Subcommittee of the Committee on Government Operations, Organization and Management of Missile Programs, p. 43.

of the radar beam can be changed instantaneously. On a timed-shared basis, the same radar can perform the functions of search and acquisition, target tracking, target discrimination, and even defensive-missile tracking, permitting the handling simultaneously of a much greater number of targets than is possible with conventional radars. In the Nike-X system, this new radar is known as the Multifunction Array Radar, or MAR. Its heart is a computer which not only controls the beam switching but also performs the decoy analysis on incoming clouds of objects and makes the decision as to which must be engaged.

Since this decision may not be possible until interaction occurs between these objects and the atmosphere, intercept must be capable of being accomplished with great rapidity. For this a new interceptor missile was required, and Sprint, the world's fastest guided missile, was designed to meet this requirement. About half the size of the Zeus missile, it is launched in what amounts to a controlled explosion and accelerates at over one hundred g's, reaching a hundred thousand feet altitude in seconds. Like Zeus, it employs a nuclear warhead for its kill mechanism.

In the employment of this system, a typical city defense might contain one MAR and three or four outlying defensive missile "farms". At each of the latter would be a Missile Site Radar (MSR), also of the phased array type, and a number of both Sprint and Zeus missiles. Although capable of independent operation, the MSRs normally would launch and guide their associated missiles to intercept under overall MAR control. Why Zeus in this "new look"?

Nike-X incorporates many of its predecessor's techniques and hardware which still have application, and the long-range Zeus missile is one of them. It would be launched against individual incoming warheads or at clouds of objects, still outside of the sensible atmosphere, to destroy them or break up their pattern. Sprint missiles would be employed to engage those objects which escaped the Zeus attack or when the decision to fire must be delayed until the MAR has sorted out the warheads from the decoys.[5]

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[5]For a more complete description of the Nike-X System, see I.O. Drewry, Jr., "The Brand Name is Nike-X", Army, Vol. 14, Feb 1964, pp. 52-55; George A.W. Boehm, "Countdown For Nike-X", Fortune, Vol. LXXII, Nov 1965, pp. 134-135.

CHAPTER 4

COST AND EFFECTIVENESS

The principal controversy to date over the merits of BMD deployment has centered on the relative effectiveness of such a system in the face of a determined missile attack. It was this argument which "killed" Nike-Zeus. The same issue is raised with Nike-X today.

This chapter will address the all-important question of defense effectiveness, as related to cost, and will indicate several defense options under consideration.

A FREE RIDE?

Despite the addition of radars which increase target-handling capacity and the incorporation of an interceptor missile which permits more rapid engagement, can the Nike-X system--or any conceivable system for that matter--cope with a mass missile attack? Even its most enthusiastic supporters admit that no defensive system can provide absolute impregnability against an all-out missile attack.[1] History reminds us time and again that, since the initiative rests with the offense, a determined aggressor can always weight his attack to penetrate or overwhelm the defense. This requires the expenditure of resources, however, and just as the US cannot spend itself into bankruptcy striving for the

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[1]Austin W. Betts, Role of Ballistic Missile Defense, pp. 10-11.

ultimate defense, so the USSR has limits on the amount it can devote to the perfect offense. Secretary of Defense Robert S. McNamara has pointed out that Soviet resources available for this purpose are more limited than those of the US.[2]

Unfortunately, the Soviets need devote no effort to enhance the penetration capability of their ICBM force unless they believe that a deployed US defense is in the offing.

> . . . There is a rough rule-of-thumb principle that no enemy vehicle of attack must be permitted to have a "free ride". The enemy should not be relieved of uncertainty with respect to any avenue of attack which it is feasible for him to use.[3]

Today, the adversary who poses the greatest, long-term threat to US security has a free ride if he wishes to use it--or if he feels compelled to use it. Soviet deliberations over targeting and attack effectiveness of their missile force are free of the uncertainties of defense penetrability.

To insure that the Soviets do not exercise this free-ride option is the responsibility of the US strategic offensive forces which have an "assured destruction" capability. Their objective is ". . . deter a deliberate nuclear attack on the US and its allies by maintaining a clear and convincing capability to inflict unacceptable damage on an attacker, even were that attacker to strike first."[4] But deterrence can fail, and the

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[2]McNamara, Statement of Secretary of Defense, p. 50.
[3]Bernard Brodie, Strategy in the Missile Age, p. 202.
[4]McNamara, op. cit., p. 38.

assurance of massive retaliation will be small consolation to the millions of US casualities resulting from an attack in which Soviet missiles enjoy a "free ride."

COST EFFECTIVENESS

Proponents of BMD state that the contribution defense can make is not some illusionary invulnerability but rather the saving of as many lives and as much property as possible in the event deterrence fails.[5] With the current emphasis on cost effectiveness as a primary tool in decision making, however, more precise answers are required to assist in determining the desirability and value of BMD. Studies addressing this question have been performed, and the results are quite revealing, although not conclusive.

One such study was alluded to by Secretary McNamara when he appeared before the House Armed Services Committee in February 1965. He indicated that in a massive surprise attack by the Soviets against US cities and military targets in the 1970 time frame this country would suffer about 70 percent fatalities--149 million deaths--if no additional steps were taken to improve the present US defensive posture. He went on to state that by the expenditure of some $25 billion (over a five-year period) on means

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[5]Betts, op. cit., p.12.

to limit damage, the number of fatalities could be cut in half. This figure is comprised of $5 billion for fallout shelters, which would save about 30 million lives; $17 billion for BMD, which would save over 40 million additional lives; and $3 billion for improved bomber defenses, with a lesser contribution to the saving of human life.[6]

It would appear that the expenditure for shelters is the most productive from a cost-effectiveness standpoint, and the Department of Defense position is that, in any case, this program should be implemented.[7] Both Congress and the general public, however, have been apathetic toward this passive defense measure.

Fallout shelter and BMD programs actually would be complementary and would contribute jointly to the so-called "damage limitation" capability of our strategic offensive and defensive forces, namely to reduce US casualties and protect industrial capacity from destruction. Existing contributors to this capability include bomber defenses, antisubmarine warfare forces, and counter-force ICBMs; but only shelters and BMD (and possibly BMEWS) would be effective against incoming missiles. In the absence of active defenses provided by an antimissile system, however, millions protected from fallout would become victims of blast; and industry would be afforded no protection. On the

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[6]McNamara, op. cit., pp. 47-48.

[7]Ibid., p. 63; James L. Trainor, "Should U.S. Deploy Nike-X?" Armed Forces Management, Vol. 11, Aug 1965, p. 32.

other hand, due to the distribution of US population and industry, it is estimated conservatively that BMD deployment providing the population protection indicated above would also save 30 to 40 percent of the adjacent industrial facilities.[8]

This is about as far as the cost-effectiveness approach can go. It can, within less-than-precise limits, put a price tag on the cost of a given level of protection. While this may be meaningful as far as facilities protection is concerned, what is its value with respect to human beings? Can a purely monetary consideration be given to the possible saving of 40 million lives through BMD deployment?[9] The answer is an unequivocal "no". Rather, it becomes a matter of extremely difficult human judgment, involving consideration of political, economic, military, and technical uncertainties.

What investment should be made in defense deployment, even granting the effectiveness advanced by its proponents? The $17 billion cited above appears to be the upper limit. It has been estimated that if US casualties are to be kept from exceeding 50 percent of the population, defense costs would approximately equal enemy offense costs.[10] In striving to prevent casualties from

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[8]Harold Brown, Notes for Interview for Nike-X System, p. 5.

[9]As an academic exercise, it calculates out to a cost of $400 per life saved.

[10]With the $25 billion defense program, including $17 billion for BMD, two-thirds of this country's population would survive an all-out attack.

exceeding 20-25 percent of the population, however, defense costs jump to four times those of the offense.[11] Obviously, the law of diminishing returns has taken over in attempting to achieve this level of defense.

A BARGAIN-BASEMENT DEPLOYMENT

The Army has proposed a limited Nike-X deployment which envisions a defense spread thinly over the entire country, rather than one concentrating on the major cities. Its price is about $8 billion (over a five-year period), roughly the cost of the Minuteman ICBM expenditure to date.[12] The most attractive feature of this deployment, in addition to its relatively low cost, is that it is tailored to the lesser threat of Communist China in the 1970s. The inventory of Chinese missiles will not be large; and the accompanying penetration aids, if any, will lack sophistication. Nevertheless, the existence of such an offensive force will constitute a threat which cannot be ignored. A limited BMD deployment, capable of growth as required, would have direct application against this threat. Secretary McNamara referred to this possibility when, appearing before a congressional committee in January 1966, he indicated that it appears technically

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[11] McNamara, op. cit., p. 50.

[12] Trainor, op. cit., p. 32; George A.W. Boehm, "Countdown for Nike-X", Fortune, Vol. LXXII, Nov 1965, p. 134.

feasible to provide substantial protection against any missiles Red China might launch during the 1970s.[13]

The Army has been accused of pressing for this minimal deployment as a means of getting the country irrevocably committed to antimissile program, starting small and inevitably growing. Col. Ivey O. Drewry, Jr., Nike-X Project Manager, thinks otherwise. He says:

> . . . I don't accept this as a back door approach to the problem. What we're doing is building a system with minimum resources for the threat that we expect to face. Furthermore the system will be such that we can assess the threat in 1970, '71, '80 or '85 and add to it as necessary. In other words, with this system, we have the ability to annually assess the threat and upgrade the system if required. This is a very straight-forward approach.[14]

The other side of the cost argument is that even $8 billion is a great deal of money, and it would be better spent strengthening the US offensive capability. It is even argued that BMD is doubly expensive because there are not only the costs incurred by its deployment but also indirect ones. These are said to result from the fact that BMD replaces no existing weapon as is normally the case when new systems enter the weapons inventory. While bookkeepers would have trouble pinpointing the indirect costs, there is no doubt that BMD would be expensive, and not just in dollars. A multi-billion dollar deployment

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[13]Richard L. Lyons, "U.S. Told Missiles Can Survive Surprise", Washington Post, 26 Jan 1966, p. 18.

[14]Trainor, op. cit., p. 32.

would involve the large-scale commitment of scientific and technical manpower and production facilities which are already in short supply. An appealing case can be made against a purely defensive weapon whose cost is in excess of most complete offensive systems, which would compete for scarce national resources, and which--in the end--might never be used.[15]

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[15] Boehm, op. cit., p. 137.

CHAPTER 5

DESTABILIZATION

A relatively new argument against BMD is that it would upset the mutual deterrent balance existing today between the US and the Soviet Union. The point is made that deployment of a system by either side would be interpreted by the other as a positive step in the preparations for initiating hostilities. Thus, deployment would destabilize the present international situation, setting in motion an arms race in both offensive and defensive weapons and perhaps even triggering a pre-emptive strike by one side.[1]

THE US VIEW

The credibility of this argument is enhanced by the support it has received in this country from a high-level citizens' panel on disarmament. The panel, headed by Dean Jerome B. Wiesner of MIT, a former Presidential science advisor, and former Deputy Secretary of Defense Roswell L. Gilpatric, urged a three-year, US-USSR moratorium on BMD deployment in a report to the White House Conference on International Cooperation in November 1965. The report speaks of "vertical proliferation" resulting from the deployment of an antimissile system of any magnitude by either side. Communist China is said to be the chief beneficiary from the

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[1]Freeman J. Dyson, "Defense Against Ballistic Missiles", Bulletin of the Atomic Scientists, Vol. XX, Jun 1964, pp. 12-18.

disruption of the current US-Soviet détente. It is contended that the moratorium would provide time to determine what strategic threat China will pose to world stability and what response the US and the USSR should make to it.[2]

There is considerable evidence that the USSR is hard at work on the BMD problem and that deployment for the defense of at least one area in the Soviet Union already has begun.[3] Is this distrubing to the US? A spokesman for the destablization theory, Prof. Freeman J. Dyson, professor of physics at the Institute of Advanced Study, Princeton, N. J., states: "A country which deploys BMD is expressing a serious intention to make itself invulnerable and is thus automatically threatening to upset stability."[4] Nevertheless, Prof. Dyson sees no reason why the US should consider Soviet anti-ballistic missile (ABM) deployment to be threatening.

> The crucial problem that remains is to convince the American Congress and public that Soviet ABM systems are not necessarily a deadly threat. The Americans must become accustomed to the idea that they may be better off without an ABM system, even if the Soviet people believe they are better off with one.[5]

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[2]Robert Kleiman, "3-Year Moratorium Urged On an Antimissile Missile", New York Times, 24 Nov 1965, pp. 1; 4; Jack Raymond, "New U.S. Delay Likely in Building Missile Defense," New York Times, 1 Dec 1965, p. 1.

[3]Robert Loebelson, "New Soviet Missile Deployment", Space Age News, Oct 1965, p. 3; George A.W. Boehm, "Countdown For Nike-X", Fortune, Vol. LXXII, Nov 1965, p. 137.

[4]Dyson, op. cit., p. 16.

[5]Ibid., p. 18.

He bases this conclusion on the different meaning the two countries attach to security, in his estimation. Americans feel their security is assured by the existence of an invulnerable retaliatory force, with the most modern penetration aids; while the Soviets believe their security is assured by the possession of the most modern defensive weapons, combined with modest offensive weapons.

THE SOVIET VIEW

What is the Soviet view on the value of BMD and its possible destabilizing effect? An insight is provided by General N. Talensky, a Soviet military historian and an editor of the Russian publication, International Affairs. In an article on the subject of antimissile systems and disarmament, he expresses the traditional Russian predilection with defense, even referring to a "law" whereby every new means of attack leads to the emergence of an effective defense. He credits BMD with an important role in the search for a reliable defense against nuclear-armed ballistic missiles, without actually stating the degree of confidence the USSR places in such defenses.[6] Perhaps this is considered unnecessary after Premier Khrushchev's 1962 boast of having antimissile missiles which "could hit a fly in outer space."[7]

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[6] N. Talensky, "Antimissile Systems and Disarmament," Bulletin of the Atomic Scientists, Vol. XXI, Feb 1965, p. 26.

[7] "Soviet ABM Claims", New York Times, 19 Jul 1962, p. 1.

On the question of destabilization, General Talensky states:

> It is said that the international strategic situation cannot be stable where both sides simultaneously strive toward deterrence through nuclear-rocket power and the creation of defensive antimissile systems. I cannot agree with this view either. From the standpoint of strategy, powerful deterrent forces and an effective antimissile defense system, when taken together, substantially increase the stability of mutual deterrence, for any partial shifts in the qualitative and quantitative balance of these two component elements of mutual deterrence tend to be correspondingly compensated and equalized.[8]

General Talensky does not rule out the possibility of an arms race as a result of BMD deployment, but he does say: "In any case, there is this question: which is preferable for security as a result of the arms race, a harmonious combination of active means of deterrence and defense systems, or the means of attack alone?"[9]

IS BMD REALLY DESTABILIZING?

The destabilization argument appears to suffer from several defects. It is paradoxical that deployment of a purely defensive system can be construed as a menacing, aggressive act. But if it can, why was the cry not heard--and much louder--when the US first augmented its impressive strategic bomber force with ICBMs, or

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[8] Talensky, op. cit., p. 28.
[9] Ibid., p. 29.

when these early ICBMs were replaced with much greater numbers of more responsive Minuteman missiles, or when deployment began of the almost invulnerable Polaris-missile submarines? It is doubtful that BMD deployment can be considered more destabilizing than these measures the US took to increase its strategic, offensive capability. And yet these steps did not trigger an uncontrolled arms race; rather, they served to strengthen the US deterrent posture and to increase international stability.

Likewise, increased defensive measures are more apt to reinforce deterrence than to erode it. They increase the uncertainty of attack success, thereby providing a balanced deterrent instead of one based on offensive, retaliatory measures alone. Proponents of BMD would add that mutual deterrence will be maintained, despite the existence of deployed defenses, if for no other reason than because there is not enough defense to go around.[10] Millions of people are going to be killed, in any case, in an all-out nuclear assault. Hopefully, these awful consequences are sufficient to deter the sane. The insane attack will be launched regardless of BMD--but a deployed defense could make the difference for national survival.

Those who advance the destabilization argument assume a human reaction which may not be typical of either Americans or

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[10]US Congress, House, Subcommittee of the Committee of Appropriations, Department of Defense Appropriations for 1966, p. 356.

Russians. Published information in this country of the possible deployment of Soviet BMD has not produced a clamor for more offensive--or defensive--means. As a matter of fact, Americans are not too interested and are rather poorly informed on the subject. A responsible US survey has indicated that 66 percent of respondents believe the United States now has a deployed BMD; the figure is 59 percent for Soviet defenses. It is interesting to note that 80 percent feel that deployment is "a good idea."[11] While this is the response of "the man in the street" and not of knowledgeable strategists and decision makers, it certainly indicates that the American public is not unduly alarmed over the possible consequences of BMD deployment. Therefore, if BMD is destabilizing at all, it is to those who are most informed on the subject of nuclear war. These, however, are the very individuals who are most aware of its effects and are most deterred from its initiation. It is doubtful that BMD is really destabilizing to them.

Advocates of the destabilization theory may have judged possible Soviet reaction to BMD deployment even less perfectly. Russians have such a propensity for defense, coupled with a rather straightforward approach to essential matters of national security, that they are probably going to deploy BMD regardless

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[11]General Electric Company, TEMPO, Public Opinion and Missile Defense. Report of an Exploratory Survey, p. 7.

of US actions or counteractions, if they are convinced of its effectiveness and possible utility. General Talensky speaks of the Soviets' desire to be the masters of their own fate when he writes: "In such conditions, the creation of an effective anti-missile system enables the state to make its defenses dependent chiefly on its own possibilities, and not only on mutual deterrence, that is, on the good will of the other side."[12]

While no attempt has been made to evaluate the propaganda aspects of Talensky's writings, his logic is clear-cut and makes sense. And he is not such a highly-placed Russian official that his reasoning could be expected by the Soviet hierarchy to have a decisive impact on US national security decisions. If this were their intent, the Soviet leaders would have insured that his views were expressed by someone in higher authority.

If Talensky's article is suspect, it is from the standpoint that it and other evidence of Soviet BMD deployment may be part of a Russian bluff or a deliberate obfuscation. Soviet emphasis on BMD would be entirely consistent with the USSR's exploitation of advanced weapons and technological progress for psychological purposes. Soviet bomber-force exaggerations, Sputnik, and the famous "missile gap" are only a few examples of cases whereby Soviet leaders have been able to distort their military strength and distract attention from their weaknesses.[13] But the deliberate

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[12]Talensky, op. cit., p. 28.
[13]Dyson, op. cit., p. 17.

Soviet exaggeration of, and preoccupation with, an antimissile capability runs counter to the thesis that BMD deployment would have a destabilizing effect on the international situation. Bluff or not, the Soviets do not appear concerned about this possibility.

Destabilization, currently the most vocal argument heard outside the US government against BMD deployment, appears a bit too contrived. Few, if any, responsible leaders in the major nations of the world today sincerely believe that the US is preparing to initiate a nuclear war and that deployed missile defenses would be a part of those preparations. As one author indicated in response to an article by Prof. Dyson: "If we can understand a benign or prudential Soviet ABM deployment rationale sufficiently well to convince ourselves that it is indeed nonthreatening, can we reasonably overlook the possibility of applying such a rationale to our own policies?"[14]

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[14]Richard H. McMahan, Jr., "Rationales for Ballistic Missile Defense Policy", Bulletin of the Atomic Scientists, Vol. XXI, Mar 1965, p. 39.

CHAPTER 6

PROLIFERATION AND Nth COUNTRY THREAT

The inevitable proliferation of a nuclear capability among the more advanced countries of the world gives rise to increasing concern over the threat, direct or indirect, which they present to US security. It will be recalled that one of the prime advantages of the $8-billion Nike-X deployment is said to be its applicability to the limited nuclear threat of the 1970s--with Communist China mentioned specifically. How valid is this contention: is there a sufficient threat from this source to warrant a multi-billion dollar defense expenditure?

"WELCOME" TO THE CLUB!

Red China's explosion of a nuclear device in October 1964 brought the question of nuclear proliferation into much sharper focus--particularly when it was determined that the device employed enriched uranium rather than plutonium. Gaseous diffusion, the most probable method by which China obtained its uranium, is the most expensive and difficult technology in the world today. That this was the source of China's uranium was confirmed by the May 1965 explosion of a second, identical device. The amount of fissile material given the Chinese by the Soviets would not have permitted the fabrication of more than one test weapon.[1] China's

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[1]Lewis A. Frank, "Nuclear Weapons Development in China," Bulletin of the Atomic Scientists, Vol. XXII, Jan 1966, pp. 14-15.

deviation from the development approach of the other members of the "nuclear club", all of which began their programs with plutonium, indicates a great determination to become a thermonuclear power at the earliest possible time--despite enormous internal, economic problems.[2]

Secretary McNamara undoubtedly had Communist China in mind when he said to a Congressional committee in February 1965: "There is also the possibility in the 1970s of a small nuclear attack on the United States by a nation possessing only a primitive nuclear force."[3] While in Paris for the NATO Council of Ministers meeting in December of that year, he indicated that China probably had already begun a program for the development of intercontinental missiles, which could result in an initial deployment as early as 1975.[4]

Mao Tse-tung, who has belittled the atomic bomb as a "paper tiger", is the same individual who espoused the thesis that "political power grows out of the barrel of a gun."[5] China is extremely conscious of the strategic implications of a nuclear capability; it strengthens her claim to a great-power status and permits her, within limits, to practice nuclear blackmail on her

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[2]Leonard Beaton, "The Chinese Bomb", Survival, Vol. 7, Jan-Feb 1965, p. 2.

[3]McNamara, Statement of Secretary of Defense, p. 49.

[4]"NATO Told of Peking's A-Strength," Washington Post, 16 Dec 1965, p. 18.

[5]Mao Tse-tung, "Problems of War and Strategy," in Selected Works, Vol. 2, p. 272.

neighbors. Playing carefully on Asian fears of nuclear war, she may hope to drive neutrals into greater cooperation with her and to force US allies in the area toward neutralism. She might even be willing to initiate a limited war with conventional weapons, calculating that the US would be discouraged from a nuclear response through fear of escalation of the conflict.[6]

HOW WILL CHINA USE IT?

But will China be prepared to risk the use of nuclear weapons on a global basis? Does the possibility exist of her initiating a missile attack on the US? One school of thought states that Peking has no illusions that the mere acquisition of nuclear weapons will provide China with a military status equal to that of either the US or the USSR. Based on a study of Chinese military doctrine, it is maintained that pragmatic, rather than theoretical, considerations dominate Chinese military thinking and that consideration of a nuclear war with the US is entirely defensive in nature.[7] This doctrine, however, was developed prior to China's initial nuclear detonation and did not deal with such questions as a strategic nuclear exchange--although the attainment of a nuclear capability certainly was anticipated by the Chinese in the early 1960s.

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[6]Alice L. Hsieh, Communist China's Strategy in the Nuclear Era, p. 171.

[7]Rand Corporation, Communist China's Military Doctrine and Strategy, p. 16.

Logically, the attainment of this capability should bring with it the realization of the dreadful consequences of its use, but the US must not underestimate the significance of indications that the Chinese leaders apparently are willing to believe that Red China could survive a nuclear war. As early as 1957, Mao is purported to have said to a visiting Yugoslav official: "We aren't afraid of atomic bombs. We have a very large territory and a big population. Bombs could not kill all of us. What if they killed even 300,000,000? We would still have plenty more. China would be the last country to die."[8] This statement, if true--Mao later indicated that he could not remember having made it but that he might have[9]--could very well have been intended solely for public consumption in an era before China had the "bomb". Nevertheless, it certainly is consistent with the traditional, Oriental attitude toward the value of human life.

Recent statements, by General Lo Jui-ching, Chief of Staff of the Chinese Army, are more alarming since they are aimed in part at psychologically preparing the Chinese people for nuclear war. The people are urged to begin thinking of the possibility of nuclear war so that, come what may, they will be in a position to win the initiative and to cope successfully with the situation.

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[8]Edgar Snow, The Other Side of the River: Red China Today, pp. 631-632.

[9]Edgar Snow, "Interview with Mao", The New Republic, Vol. 152, 27 Feb 1965, p. 19.

Sacrifices, losses, and destruction are recognized as consequences of such war, but ". . . it will also educate the people."[10]

If this is indicative of Chinese thinking, then Dr. Ralph E. Lapp, nuclear physicist and author, may be correct when he expresses the view that in a very few years China can become ". . . the most dangerous nuclear power of all--not because the Chinese leaders can match the United States might, but because they do not seem to understand nuclear war and therefore may not be rationally deterred from starting one."[11]

Communist China's often irrational statements regarding nuclear war may be only outward manifestations of an aggressive, xenophobic, "have-not" nation. Whether she will assume a more responsible attitude with the attainment of a full nuclear capability involves a complex judgment of Chinese intentions--a real strategic uncertainty. It appears most probable that the addition of this nuclear capability will find its real application in the political sphere: in the intimidation of neighbors, in fostering instability in the Far East, in prejudicing existing security arrangements, and in imposing restraints on US policies in the area. If, on the other hand, China is not dissuaded from serious consideration of the employment of nuclear weapons--regionally or globally--US nuclear deterrent forces have failed the test of credibility, and active US antimissile defenses are required.

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[10]Max Frankel, "Peking Army Chief Urges A-War Plans," New York Times, 13 May 1965, pp. 1; 17.

[11]Ralph E. Lapp, "The Nuclear Power of China," Life, Vol. 58, 28 May 1965, p. 86.

IMPACT ON US ALLIANCES

The Communist Chinese may very well question US resolve to support Asian allies if the prospect of a nuclear war results from such involvement. When China has the capability to bring nuclear destruction to the US, it will be difficult to convince her--and our allies in the area--that any Asian issue is sufficient to run the risk of nuclear war.[12] The US has long experienced the same problem with some of its allies in Europe, where there are many more reasons to believe in US resolve than in Asia.

Thus, it is argued by BMD proponents that the US nuclear guarantee in support of its alliances becomes more credible through the deployment of missile defenses. This argument is most valid when considering the Chinese threat, which will be manageable for the defenses in terms of numbers.[13]

Large thermonuclear warheads arriving over the US in limited quantities, in all probability without penetration aids, or at

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[12]Stanford Research Institute, Chinese Communist Foreign Policy and the Nuclear Threat to the United States, pp. 30-31.

[13]One reason the Chinese appear embarked on the early attainment of a thermonuclear capability may be that, realizing the limitation on long-range delivery means for the foreseeable future, the Chinese are anxious to obtain as much destruction as possible from each weapon, in the event of war. The geodetic problem of tying continents together for targeting purposes may be another consideration. The less the accuracy with which this can be achieved, the greater the requirement is for a large radius of damage in the employment of strategic nuclear weapons.

best with decoys which are easily discriminated, provide the ideal targets for deployed missile defenses. It is possible in these circumstances to contemplate minimal damage to defended areas in this country, thereby increasing the credibility--to allies and enemies alike--of US resolve to fulfill its nuclear guarantee. China would think long and hard before initiating an attack which has little or no chance of success but which would bring massive retaliation in return.

THE Nth COUNTRIES

The 1964 Chinese nuclear event generated concern in the US not only over Communist China but also with regard to other potential nuclear powers, the so-called "Nth countries." A number of studies have been made to determine how large "N" may become in the next decade or so. One such study indicates that there are 40 or more countries with sufficient resources to develop a nuclear capability in the next 10 to 15 years, without receiving significant outside aid or pooling their efforts with other countries. These countries have, or will have, the necessary capital, technology, labor resources, and possibly the political motivation to develop nuclear weapons. The study points out, however, that nuclear weapons are not nuclear-weapon systems. There are less than 20 countries with the necessary economic resources to develop both the weapons and their associated

delivery systems in this time frame. The later are grouped according to their possibilities as follows:[14]

MORE LIKELY		LESS LIKELY	
India	South Africa	Australia	Italy
Indonesia	UAR	Canada	Pakistan
Israel	Spain	Czechoslovakia	Philippines
Japan		Greece	Sweden
		Iran	

From even a cursory examination of this list, it is immediately apparent that few of the potential nuclear powers are hostile--or even unfriendly--to the US. This does not mean, of course, that proliferation is not of serious concern to this country because of the possibilities of escalation resulting from Nth country use of nuclear weapons.

Some proponents of BMD deployment carry this concern a step further and apply an Nth country modification of the Communist-China case in their advocacy of deployed antimissile defenses. Scenarios have been adumbrated wherein one or more of these countries develop both nuclear weapons and long-range missile capabilities, and the US becomes involved in disputes between them and "third" countries because of bilateral or regional security guarantees. The argument then runs that without BMD the effectiveness of the US deterrent might be viewed very skeptically, whereas with deployed defenses the US could not be blackmailed or otherwise intimidated against meeting its alliance commitments.

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[14]Stanford Research Institute, Nth Country Economics: I. How Large Can "N" Be?, pp. 1-3.

In the same general vein, the theory is also advanced that US antimissile defenses would tend to inhibit proliferation among "second-rate" powers by making the cost of a credible nuclear force prohibitive.[15]

These arguments appear both questionable and irrelevant to the issue of BMD deployment today. Considering their present stage of technological development, it is extremely doubtful that any of the Nth countries, within the time frame of interest to Nike-X, can achieve an intercontinental missile capability--or that any is inclined to do so even if capable of such a task. Few of them have aspirations of achieving great-power status. Their problems are of a regional nature; and their military requirements are for weapons of limited range, capable of striking enemies across national boundaries or at most across subcontinents.

On the other hand, if these countries believe they have a requirement to develop nuclear weapons--for whatever reasons, political or military--it is extremely doubtful that they will be deterred by considerations of the credence of their nuclear force in the eyes of the great powers. They have no illusions of involvement in a nuclear confrontation with the world powers, but they do recognize the impact on their neighbors and adversaries of the attainment of even a very limited nuclear capability. Their

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[15]C.J. LeVan, The Strategic Implications of CONUS Defense (U), pp. 128-129.

decisions regarding development of this capability will be based on an analysis of its regional, rather than its global, value.

RED CHINA IS THE THREAT

Of the burgeoning nuclear powers, only Communist China appears to possess the two essentials to make it germane to the issue of BMD deployment in the US within the next decade; necessary technological-industrial potential and possible military threat. China has the capability and apparently feels the need to fabricate nuclear weapons in quantity and their associated long-range missile delivery means. Against the threat or actual use of such a force, deployed US defenses would achieve their greatest effectiveness; but even in this case, Secretary McNamara is prepared to assume a calculated risk. Speaking of the possibility in the 1970s of a small nuclear attack on the US, he said in February 1965:

> . . . we have undertaken a number of studies in this area. Our preliminary conclusion is that a small balanced defense program could, indeed, significantly reduce fatalities from such an attack. However, the lead time for additional nations to develop an effective ballistic missile system capable of reaching the United States is greater than we require to deploy the defense.[16]

If this is an evaluation of just Nth country capabilities, it appears sound; but if Communist China is included in the group, there is cause for concern. Time and again the US has been guilty

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[16] McNamara, op. cit., p. 49.

of underestimating the capabilities of aggressive, totalitarian states. Operating behind a tight security veil, they have been able to marshal and direct resources toward the accomplishment of specific priority objectives in a fashion not possible in a democratic nation. The controlled nature of their political systems and economies, which are not unduly concerned with the needs and desires of their peoples, has permitted them to overcome the obstacles and limitations which caused the US to be overly conservative in its estimates of their capabilities.

The US could fall into this trap again with regard to China's attainment of an intercontinental missile capability. Despite sophisticated intelligence-collections means, it is possible for this country to misjudge by several years the actual state of Chinese development of such weapon systems. An error of this magnitude, considering the extensive Nike-X deployment lead time (measured in years), might provide the necessary margin for China to win the subsequent offense-defense race.

In 1958, Communist China issued its "Draft Twelve-Year Plan for the Development of Science and Technology." It established 57 specific priorities for development, the highest of which were atomic energy, electronics, and jet propulsion technology.[17] The handwriting was on the wall. Six years later the Chinese detonated their first nuclear device; but, as stated earlier, the real surprise

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[17]Frank, op. cit., p. 14.

was the use of enriched uranium. Who is to say what surprises China has in store for the US regarding the development of long-range nuclear-delivery systems?

CHAPTER 7

CONCLUSIONS

Both East and West appreciate the horror of nuclear war, from which neither would emerge the victor. The Soviet Union and the United States, the two great nuclear powers, currently are striving to accomplish their national objectives while avoiding a direct confrontation on matters of vital interest.

That neither side would rationally take steps leading to nuclear war, however, does not guarantee that it cannot occur. Both sides have amassed formidable nuclear forces. The trend in the evolution of these forces has been to make them more and more invulnerable, as witness the shift from bombers to missiles, the hardening of missile sites, the development of penetration aids, and the deployment of missile-firing submarines. And yet in this country, the only defense against this threat lies in the deterrence provided by opposing offensive forces. These, unfortunately, make no provisions for the failure of deterrence--other than massive retaliation. This assures mutual destruction but does little to limit damage to the US from an enemy first-strike.

In the current era of peaceful coexistence, with reliance on mutual deterrence, US decision makers are loath to commit billions of dollars to defense means which, even if called upon, would not provide complete protection. This appears to be the crux of the matter--the high cost involved versus value received.

Defense Department studies show that fallout shelter-ballistic missile defense combinations can save over 70 million lives in the event of a massive Soviet attack and even a modest BMD deployment would prove effective against a more limited Communist Chinese attack. It would appear that from an effectiveness standpoint, BMD passes the test.

As for cost, there is no real question that the US can afford the price of protection against ballistic missiles. A country whose GNP stands at $675 billion and is growing currently at the rate of 5.5 percent, and whose proposed federal budget for FY 1967 amounts to almost $113 billion--including $21 billion for welfare, benefits, and services to its poor--can afford the measures which could mean the difference between national survival and annihilation.

Other arguments for and against deployment are pertinent, but they are side issues compared to the central one of cost versus effectiveness. The impact of such strategic questions as international destabilization and nuclear proliferation will be debated at length but will not decide the basic issue.

The likelihood of attack is certainly a consideration in deployment. While it appears low now, changes in Soviet leadership, escalation of limited conflicts, miscalculation of enemy intentions and reactions, and the inevitable rise of Communist China as a nuclear power all provide fateful possibilities for a nuclear exchange. It is hoped that if the prospects of general

nuclear war were high, this country would undertake BMD deployment, regardless of cost. Unfortunately, the situations which could generate the requirement for its employment are not of the type which would wait for its deployment.

Several points should be borne in mind in all considerations of ballistic missile defense deployment:

a. US strategy must provide for the eventuality of the failure of mutual deterrence--massive retaliation is not enough.

b. To be balanced, US strategic forces must include damage limiting means against all forms of attack--there is now no defense against the most serious threat.

c. Aside from their contribution to deterrence, strategic defensive systems provide the US with a stronger will in crisis situations--bargaining from a position of greater strength is always advantageous.

d. No weapon system has ever provided an invulnerable defense and almost certainly never will--butthis does not mean that the defense task should not be undertaken.

It is the strong contention of this writer that the possibility of saving over 70 million lives through a combination fallout shelter-ballistic missile defense program is such as to warrant its immediate implementation.

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